

[54] **PROCESS FOR THE REMOVAL OF NO FROM FLUID STREAMS USING A WATER-SOLUBLE POLYMERIC CHELATE OF A POLYVALENT METAL**

[75] **Inventor:** Robert R. Grinstead, Walnut Creek, Calif.

[73] **Assignee:** The Dow Chemical Company, Midland, Mich.

[21] **Appl. No.:** 837,927

[22] **Filed:** Mar. 10, 1986

[51] **Int. Cl.⁴** C01B 21/00; C01B 17/00; B01J 8/00

[52] **U.S. Cl.** 423/235; 423/239; 423/242; 423/243; 423/244

[58] **Field of Search** 423/235, 235 D, 239, 423/239 A, 242 A, 243 P, 244 A, 244 R

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,932,585	1/1976	Moriguchi et al.	423/235
3,974,090	8/1976	Mitchell	252/389 A
3,984,522	10/1976	Saito et al.	423/235
3,991,161	11/1976	Saitoh et al.	423/235
3,992,508	11/1976	Saitoh et al.	423/235
4,044,101	8/1977	Hisamatsu et al.	423/235
4,055,623	10/1977	Saitoh et al.	423/235
4,079,118	3/1978	Gorai	423/235
4,081,509	3/1978	Hishinuma et al.	423/235
4,087,372	5/1978	Saitoh et al.	252/184
4,091,074	5/1978	Gorai et al.	423/235
4,113,837	9/1978	Kendall et al.	423/242
4,126,529	11/1978	DeBerry	423/242 X
4,347,227	8/1982	Haas et al.	423/235
4,386,058	5/1983	Hass	423/235
4,423,158	12/1983	Porath	521/32

4,448,899	5/1984	Haas et al.	423/235
4,518,745	5/1985	Engelhardt et al.	525/326.6

FOREIGN PATENT DOCUMENTS

53-34679	3/1978	Japan	423/242
----------	--------	-------------	---------

OTHER PUBLICATIONS

G. Grillot et al., "The Condensation of Diethylamine and Formaldehyde with Phenol, o-, m-, p-Cresols", JACS, vol. 67, pp. 1968-1969 (1945).

P. R. Klinkowski, "Ultrafiltration", Kirk-Othmer: Encyclopedia of Chemical Technology, vol. 23, pp. 439-461 (1983).

E. F. Leonard, "Dialysis", Kirk-Othmer—Encyclopedia of Chemical Technology, vol. 7, pp. 564-579 (1979).

Primary Examiner—Gregory A. Heller

[57] **ABSTRACT**

The present invention relates to a cyclic continuous process and composition for the removal of NO and SO₂ from a variety of fluid streams. A fluid stream containing NO and SO₂ is contacted with an aqueous solution of water-soluble organic polymeric chelate containing a polyvalent metal, e.g., Fe (II). The NO is catalytically absorbed and in the presence of SO₂, the imidodisulfonate is formed. Optionally, a reducing agent, such as sodium hydrogen sulfide, is added to maintain the polyvalent metal in the reduced state. The process next includes removal of the imidodisulfonate formed. The separation of water and low molecular weight materials and products, e.g. molecular weight below 500, usually occurs by ultrafiltration or dialysis, with recycle and re-use of the polyvalent metal chelate.

17 Claims, 2 Drawing Figures